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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/019,975

10/23/2001

Kazuhito Hatoh

10059-398US

9256

(P22752-01)

570

7590

12/04/2003

EXAMINER

RUTHKOSKY, MARK

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ONE COMMERCE SQUARE
2005 MARKET STREET, SUITE 2200
PHILADELPHIA, PA 19103-7013

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 12/04/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

10/019,975

Applicant(s)

HATOH ET AL.

Examiner

Mark Ruthkosky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 6) ☐ Other: _____

DETAILED ACTION

Priority

The application is a 371 of PCT/JP00/02506 filed 4/17/2002.

Information Disclosure Statement

The information disclosure statement filed 5/3/29/2002 has been placed in the application file, and the information referred to therein has been considered as to the merits. Document JP 9-511,356 has not been considered as it is written in Japanese and it is not cited on the foreign search report.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 does not list any claim limitations and claim 4 depends from claim 3, therefore these claims cannot be examined, as the subject matter is indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2 and 5 are rejected under 35 U.S.C. 103(a) as being as being unpatentable over Hiroshi et al. (JP 8-111,230.)

The instant claims are to a method of operating a polymer electrolyte fuel cell.

Hiroshi et al. (JP 8-111,230) teaches a fuel cell including a pair of electrodes a polymer electrolyte membrane, a conductive separator, a fuel and oxidizing gas supply and a means for circulating coolant. A method of operating the fuel cell is taught wherein the optimal value of the temperature of the upper section inside the cell at which the output is the greatest and the optimal value of the difference between the temperature in the upper section inside the cell and the temperature in the lower section inside the cell, are determined from the current density, reactant gas pressure, the inlet air dew point, the air utilization ratio, and the rate of discharge of water produced, by adjusting the temperature and flow of the coolant, such that the optimal value of the temperature in the upper section, and the optimal value of the difference between the temperature in the upper section and the lower section can be controlled. Since a balance is always reached between the water produced and discharged in any section within the cell, the reference presents conditions of measuring and regulating physical quantities disclosed in the claims (pg. 4, lines 3-9.) The reference further teaches that the temperature distribution within the cell is formed in such a manner that it increases progressively in the direction in which the reaction gas flows (page 5, left column, lines 14-17.) This would include the electrode length from the inlet to the outlet.

Claim 1 further states that a property value, Y, is maintained according to the formula (1)

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$$Y = V^n \times (\Delta P)^n$$

wherein V indicates a flow rate in (m/sec) of the fuel or oxidant gas; ΔP is the difference between a saturated stream pressure and a stream pressure in the fuel or oxidant gas in (kgf/m²), and $1 < m < 2$ and $1 < n < 2$ are satisfied to meet the values of 2×10^3 to 1.4×10^8 . The reference does not teach this specific relationship, however, it is noted that when the values of m and n are equal to one and the current density is 0.3 A, the value of Y is in the range of 2,000 to 30,000 and that when the value of Y is greater than 30,000, the cell is overly dried. Since a balance is always reached between the water produced and discharged in any section within the cell, the reference presents evidence that it would be obvious to one of ordinary skill in the art at the time the invention was made to prevent the drying of the cell. This would be obvious to one of ordinary skill in the art, as the drying of the cell will not provide optimal conditions for producing electrical current.

Further, the reference does not teach that the gas outlets are made substantially open to an ordinary pressure. The vapor pressure distribution of the reaction gas is noted to be such that the pressure increases the closer it gets to the gas flow outlet port side and it prevents the discharge of water. From this it would be obvious to one of ordinary skill in the art at the time the invention was made to allow for the gas pressure at the outlet to be at a normal pressure in order to allow for water to be discharged from the outlet side.

Allowable Subject Matter

Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and

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any intervening claims. The reference does not teach altering the temperature of the electrode starting point through the exit point such that the change in temperature along the length of the electrode is reflected in a curve opening downwards or that the temperature increases to a point and then decreases along the length of the electrode in order to form a curve opening downwards.

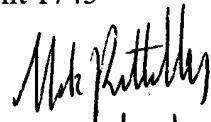
Examiner Correspondence

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1193. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 703-305-0587. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:00.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 703-308-2383. The fax phone number is 703-872-9306.

Mark Ruthkosky

Primary Patent Examiner

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11/26/03